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"It would thus appear that specks of living matter may be born in suitable fluids, just as specks of crystalline matter may arise in other fluids. Both processes are really alike inexplicable—both products are similarly the result of the operation of inscrutable natural laws, and what seem to be inherent molecular affinities. The properties of living matter, just as much as the properties of crystalline matter, are dependent upon the number, kind, and mode of collocation of the atoms and molecules entering into its composition. There is no more reason for a belief in the existence of a special "vital force," than there is for a similar belief in the existence of a special "crystalline force." The ultimate elements of living matter are in all probability highly complex, whilst those of crystalline matter are comparatively simple. Living matter develops into Organisms of different kinds, whilst crystalline matter grows into Crystals of diverse shapes. The greater modifiability of living matter, and the reproductive property by which it is essentially distinguished from crystalline matter, seem both alike referable to the great molecular complexity and mobility of the former. Crystals are statical, whilst organisms are dynamical aggregates, though the evolutions of both marked by their peculiar characteristics, may be regarded as visible expressions testifying to the existence of one all-pervading power—

> "Whose dwelling is the light of setting suns,
> And the round ocean, and the living air,
> And the blue sky, and in the mind of man:
> A motion and a spirit that impels
> All thinking things, all objects of all thought,
> And rolls through all things."

NATURAL HISTORY MISCELLANY.

BOTANY.

On the Lever-like Anthers in Salvia.—It must, I think, be evident to many observers that what we are prone to consider beautiful adaptations in the organs of flowers, are, as we should say of many of the operations of men, merely *afterthoughts;* that is to say that often parts would be formed without any idea of the uses which would be subsequently made of them. I have perceived this for some time, but hardly dared express it in the face of the universal belief that everything was designed for some special use and purpose. Last year, however, I submitted in these pages the idea that if the petaloid lobes of the divided anthers in Salvia, which closed the throat of the corolla in most of the species, were really designed to aid in the diffusion of the pollen by insect agency, the subsequent clasping of the stamens by the upper lip of *Salvia involucrata* and thus preventing the said action, was a queer proceeding.

I hope that this matter will not be lost sight of by those who advocate the universal adaptation theory, and to aid in keeping the subject fresh, I would point out that in *Salvia coccinea* the "lever" arrangement exists as in most other Salvias, but are set back against the upper surface of the corolla, in such a way as to be absolutely useless as an obstruction of the throat, or for any purpose whatever that I can see. It is getting to be the fashion to refer any useless organs or structures to some supposed distant progenitors, from which the modern organism sprung. Our whiskers and so forth for instance, are said really to belong to the monkey from which we are descended, rather than to the modern man to whom they are now attached. It will be a curious study for botanists to trace out the progenitors of these Salvias which may claim the original uses of these petaloid anthers in cases where they are as useless now as the hair on our faces. But if we may be pardoned for deriding easy beliefs, as well as easy labors, we may say of some of these matters, as we say of pollen or of seeds themselves, that nature makes numberless things, for which she has no use whatever. Perhaps it may be, that like the human mind, the mind of nature likes variety and profusion, in the effort for which mere utility is not always consulted.—THOMAS MEEHAN.

[Should Mr. Meehan read E. Müller's Discourse, in the July number of the NATURALIST, he will notice that, with the Darwinian school, and in virtue of the very terms of the theory which has imparted so much interest into the subject, "universal adaptation" is regarded as a consequence rather than as a forethought. Thus far he would seem to be in accord with Darwinians. But in nothing could he more widely diverge from their way of thinking than in his suggestions that "Nature makes numberless things for which she has no use whatever," if by his metaphorical expression he means that the "things" are of no use to the beings that produce them. And of this sort, "pollen and seeds" are queer examples. Does he mean that these are useless because superabundant enough to ensure against risk and loss and appropriation by animals, through which fertilization and dispersion are subserved?—EDS.]

PETALS IN ATRAGENE.—I have just taken a number of specimens of *Clematis* (*Atragene*) *alpina* which have well developed petals. In the subgenus Atragene, as is well known, the outermost of the stamens are usually abortive, as if to represent the true petals, which are wanting. I have in one flower, not less than ten good petals, all of them being as long as the sepals, two-thirds as broad, and quite as deeply colored.

These petals are all entirely destitute of any traces of the anther at their tips; nevertheless, in all the specimens in question, the transition from stamen to petal, is a gradual one, similar to what is seen in the flowers of Nymphœa. The usual four sepals are perfectly normal, and differ from the petals only in being broader.—EDWARD L. GREENE, *Golden City*, *Col. Territory.*

TRANSPIRATION OF LEAVES.—In the monthly report of the Department of Agriculture for March and April, 1871, page 149, is a short notice on transpiration of leaves. Pettenkofer is named as the observer, but he only made the report of the experiment, which was performed by Prof. Fred Pfaff in Erlangen. Being on a visit to Germany two years ago and standing under the same oak tree, which was the object of the observation, my old friend Mr. Pfaff explained to me his mode of calculations, which may be of interest to some of your readers.

Cutting a small twig with the leaves, he brought it in a wide mouthed glass bottle, corked and weighed it. Then he exposed the leaves to the open air, weighed it again, after three to four minutes and marked the differences, from which he calculated the evaporation of the leaves in a certain time. Then he outlined each of the leaves on fine paper, the weight and measure of which he had ascertained, cut the outlines out and weighed these again; from the difference of weight he calculated the difference of measure, and accordingly the surface of all the leaves. Afterwards he calculated the surface of the foliage of the whole tree in the following manner: the crown of the tree was a regular elipsoid and easily measured; deducting the inner leafless part, he found the bulk of the leafed part. Attaching cubes of different sizes, made of thin sticks representing the edges of the cube, to parts of the crown of different density of foliage, he counted the leaves falling into the hollow space and calculated by repeated measurements the average number of leaves of the whole tree and the average surface of them.

The loss by evaporation was measured at different hours of each day, from the 18th of May to 24th of October; this reduced the average loss for a square inch surface, and from this was calculated the average loss from all the leaves of the tree during the season.

Many minute precautions were taken, which to mention here is not necessary; but it may be remarked that when exposing the leaves for evaporation he suspended the twigs in the shade, and as the cut twigs during the experiment were deprived of any succor from the tree, the loss is to be considered as a minimum.

The intention was not to find the exact amount of transpiration, but to prove that during the season the tree evaporates considerably more water than it receives by rainfall, and so the method answers the purpose.—FRED. BRENDEL, *Peoria, Ill., 9th of June,* 1871.

ZOOLOGY.

SPAWNING OF THE GOOSE FISH (*Lophius Americanus*).—During the summer season the fishermen on the New England coast often notice a substance floating in the water, which they term "a purple veil" the precise nature of which has caused much speculation on their part, and which answers singularly well to its designation.

During a late cruise I encountered one of these veils, which presented the appearance of a continuous sheet of a purplish brown color, twenty or thirty feet in length and four or five in width, composed of a mucous substance which was perfectly transparent, to which, as a whole, a purple color was imparted by the presence of specks distributed uniformly throughout the mass to the number of about thirty or more to the square inch. I was unable to ascertain whether this was actually a simple sheet or a collapsed tube as the material was so extremely slippery that it was impossible to retain it in a position where it could be easily examined. With much effort we succeeded in bringing a portion upon the deck of our boat, when it ran out almost immediately through the scupper holes. To our surprise on closely examining the specks, which gave color to the mass, we found them to consist of embryonic fish, moving vigorously in their envelope but without